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Question 1

Assuming that the two years - rate is decided as the average of the 1 year - rate ~~and~~ for the first year and the implicit 1 year - rate for the second year, we can use this to solve for the implicit forward rate 1 year from now:

$$0,0064 = \frac{1}{2} (0,0046 + i_{\text{forward}1})$$

$$0,0128 - 0,0046 = i_{\text{forward}1}$$

$$i_{\text{forward}1} = 0,0082 = \underline{\underline{0,82\%}}$$

Similarly, we can use the 2 - and 3 - year rates to solve for the forward rate two years from now:

$$0,0079 = \frac{1}{2} (0,0064 + i_{\text{forward}2})$$

$$0,0158 - 0,0064 = i_{\text{forward}2}$$

$$i_{\text{forward}2} = 0,0094 = \underline{\underline{0,94\%}}$$

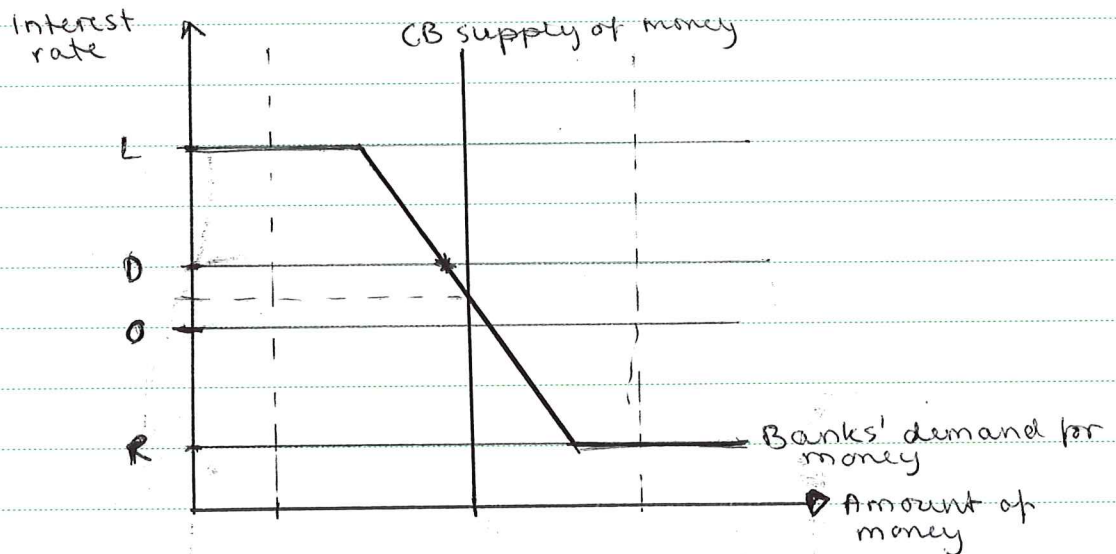
As we see, the 1 year implicit rates are higher than today's 1 year rate, and the one two years from now is higher than the one one year from now. This is because the future is unknown, and the interest rates need to be higher to compensate for the risks of the future, for instance inflation.

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Question 2

The central bank chooses an interest rate to achieve a given inflation rate over time (2,5%). To achieve the optimal interest rate, the central bank controls the money supply in the economy. The interest rate is given where supply equals demand of money. The central bank also uses quotas to ensure that the banks will borrow and lend with each other, rather than with the central bank.



L is the highest interest rate banks will accept to borrow money for, while R is the lowest they are willing to receive on deposits.

D is the optimal interest rate. The CB could set supply to reach the point * in the figure, but they will often set the supply somewhat higher, to ensure that banks rather trade with each other to the ~~best~~ optimal interest

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rate, that are higher than the overnight rate in the central bank.

Bond prices are given by:

$$P = \frac{F}{(1+i)^T}$$

where:

P - price

F - face value

i - interest rate / yield to maturity

T - time until maturity

Often we know the price and face value of a bond, and can derive the interest rate from that. We see that the price of bonds is inversely dependent on the interest rate.

One way the central bank can control the supply of money is to buy and sell bonds. If they buy bonds, this will increase the money supply. Buying a lot of bonds will increase the price of bonds, which will ~~increase~~ reduce the yield to maturity, and as we can see from the figure above, increased supply of money gives a lower interest rate. If the central bank wishes to increase the interest rate, they will have to

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reduce the supply of money by selling
bonds. Increased supply of bonds will
give a lower bond price, but higher
yield to maturity / interest rate.

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Question 3

A subsidiary bank is ~~an~~ an independent bank, owned by a foreign mother bank, while a branch is part of the mother bank even if they are operating abroad. This means that a subsidiary is regulated by the host country, and are limited to accessing only their own capital, while a branch is regulated by the authorities in the home country of the mother bank, and the branch accesses the full capital of the mother bank.

When Nordea decided to reorganize from subsidiary to branch, this might be caused by a wish to exploit economies of scale, i.e. accessing the capital of the whole banking group to be able to loan out more money, and maybe to be able to use information, models for screening etc. from the mother bank to reduce costs. They might also find Swedish regulation more favorable than Norwegian. This might be the case because Norway has implemented the Basel III regulations more rapidly than most of the EU, but since it is decided that the whole EU should implement the Basel III, this seems like a less likely explanation.

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The consequences of Nordea becoming a branch is that Norwegian authorities will no longer regulate Nordea's activities. Depositors will no longer be covered by the Norwegian deposit insurance at 2 mill. NOK per person per bank, which is currently higher than the European deposit insurance, unless Nordea chooses to "top up" by paying premiums to the Norwegian Guarantee fund. If they do so, Norway will cover the rest of the insurance up to 2 mill. NOK, and depositors will be just as safe as when Nordea was a subsidiary.

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Question 4

Equity pricing depends a lot on expectations: the expected dividend payments and expected growth in these affects the price positively, as does the expected return on holding ~~the~~ the stock, while risk will affect the price negatively.

When the results of Norske Skog were weaker than expected, stock holders will expect lower dividend payments and consider the stock less valuable, and wish to sell out. This combination of increased supply and lower expectations ~~reduced~~ reduced the price of the stocks.

When the CEO sold all his shares, this would have lowered peoples' expectations further, as this is a person we believe to have all the relevant information about the firm. When he decides to sell out, this sends a clear signal to the market that the company is not doing well, and other investors will find it wise to sell out as well, pushing the prices further down.

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Question 5

Before the Norwegian banking crisis, there had been deregulations of the banking sector (removed cap on interest rate, less strict capital control) which gave the banks incentives to compete for market shares by lending a lot of money. Then there was a fall in the oil price and the economy slowed down. The banking crisis started because people wasn't able to pay their loans back to the banks. This led to large losses in the banks' capital, but there were no runs on the banks. The banks' guarantee fund was depleted to cover the losses of the first banks that failed.

↘ capital

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Question 6

The basic banking system was mainly concerned with liquidity provisions - keeping deposits for customers, and having them available on demand, and maturity conversion - using these short term deposits to offer longer term loans. They earned a profit by charging higher interest rates on the loans than what they paid to the depositors.

The modern financial system includes a lot of new actors, consisting of conventional banks, investment banks, different kinds of funds, brokers and insurance companies to mention some. The modern system includes the functions of basic banking, but also a wide range of new services and products. For instance the ability to issue bonds rather than taking a conventional loan, investing your savings in stocks, bonds, short positions etc. rather than putting them in savings accounts and the possibility to invest in derivatives like interest swaps, FX swaps or futures to hedge against changing rates/prices.

risk of

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Thus, the modern system offers great advantages to allocate risk between actors according ~~to~~ to their level of risk aversity. As the modern system relies on modern technology, it can also be much more efficient than basic banking, as transactions can go faster, and ~~access to~~ information about other actors, for instance borrowers, is more easily accessible as it is easier to keep track of their habits when almost everything is electronical.

The basic banking system was exposed to instability since it was harder to monitor the borrowers ~~afterwards~~ ~~or~~ or screen them in advance, giving a high risk of loan defaults. ~~Monitoring loan borrowers was not possible at the result of~~

As there were no deposit insurance to rely on, these banks were very exposed to bank runs - a lot of (all) depositors wanting to withdraw their money at the same time, due to some belief that the bank wasn't doing well. This would cause troubles for the banks, as most of their deposits were lent out rather than kept in the vault.

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The modern financial system is not as exposed to bank runs, because most countries have deposit insurance to ensure that people won't withdraw even if the bank is in trouble.

But if there were no deposit insurance, or if it was not credible, the modern system would be exposed to bank runs as well.

These runs could be even more catastrophic than traditional runs, as they would involve just a few clicks on the depositors' computers at home, making it possible to withdraw huge amounts of money in just a few minutes, as opposed to traditional runs where you would have to stand in line at the physical bank to withdraw.

Since the modern system is so dependent on electronic solutions, this is also a big source of instability. If the electronic systems of a financial actor were to stop working, even ~~for~~ over just a short amount of time they could lose a lot of money because of lost trade deals.

Another source of fragility in the modern system is the new and very complex products. As these might be hard to monitor, or even to understand, there are large risks of them failing. As modern banks are a lot more interconnected than traditional banks, there is also increased risk of contagion from one failed bank to others, increasing the possibility of systemic crises.

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Finally, while deposit insurance has reduced the risk of bank runs, this has given customers no incentive to monitor the banks' actions. Less monitoring might give the banks incentives to increase risks in their operations, to maximize expected returns.

Financial regulation has evolved a lot from the basic/traditional banking system to the modern one. We've seen that deposit insurance have been implemented to avoid bank runs. As this also gives incentives for moral hazard in the banks - taking too much risk - this regulation has been followed by more regulations of the banks' operations. These regulations are the Dodd-Frank act in the U.S., and the Basel accords in Europe. These regulations includes requirements of minimum amounts of capital, specific requirements for individual banks, and requirements for financial disclosures.

The minimum amount of capital required is given as the ratio of capital to risk-weighted assets: $\frac{\text{capital}}{\sum \text{risk weight}_i \cdot \text{asset}_i}$

The purpose of this is to ensure that the bank has enough capital to handle losses on assets, like loans, and that they don't acquire too much risky assets. This might help avoid a

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systemic crisis. As this ratio is very difficult to measure, a second line of defense is to measure the ratio of capital to loans. This is a much easier ratio to measure, but shouldn't be the only way to measure capital, as it completely ignores risks.

The central bank also ~~requires~~ requires the bank to hold a certain amount of deposits relative to loans in reserves. This is a macroeconomic regulation aimed at keeping the money supply at the desired level, but will also help the banks meet customers' demands for liquidity. According to Basel III, the banks should hold enough liquid assets for 30 days of crisis, as this is seen as enough time for the government to intervene and help the bank out of the crisis again.

There are also more requirements for institutions seen as systemically important (SIFIs). These need to hold a higher ratio of capital to assets, because the failure of these banks might lead to systemic crisis. In Norway, the SIFIs are DNB, Nordea and Kommunalbanken.

Other regulations include rules for the banks' lending, for instance that the loan can't exceed five times the income of the borrower, requirements of how much interest rate increase the borrower should be able

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to handle, or that you can't borrow more than 85% of the price of the house you are borrowing.

As we can see, there have been implemented a lot of restrictions on the modern banking/financial system. On the other hand, banks have become more free to offer new products/services, there have been a lot more and different actors in the system to provide for "new needs", so not all regulations have been concerned with making the modern system more strict than the traditional one.